

BOOK REVIEW

Alice F. Tryon and Bernard Lugardon. 1991. *Spores of the Pteridophyta: Surface, Wall Structure, and Diversity Based on Electron Microscope Studies*. 648 pp. Springer-Verlag, 175 Fifth Ave, New York, NY 10010. ISBN 0-387-97218-8. (Price: \$98.00, hardcover.)

The spore-wall features of spore-dispersed plants such as ferns and clubmosses have long been known for their beauty and variation. In a new book by Alice Tryon and Bernard Lugardon, these features have been exhaustively portrayed in an unparalleled compendium of data on spore-wall ultrastructure. This abundantly illustrated volume focuses both on surface features as seen under the scanning electron microscope and the interior-wall features visible in transmission electron micrographs. It will prove a landmark volume for students of plant evolution and ecology as well as sedimentary petrologists and commercial groups interested in identifying productive sedimentary strata.

This work is the product of a remarkable international cooperation; Bernard Lugardon developed the transmission electron micrography in France and Alice Tryon pursued the scanning electron microscope work in the United States. Their years of work together have paid off in a highly integrated volume with a single message supported by two enormous data sets relevant to the same biological issue, the significance of spore design to systematics and evolutionary studies in the spore-dispersed plants.

The book includes two sections, a general introduction and a survey of the genera. The introduction provides a valuable overview of spore structure and development; it is rich in detail and at the same time accessible. The long-standing confusion about the chemical and structural correspondence of seed-plant and fern spore coats is resolved in a lucid and well-illustrated essay: we can now say that there is little if any homology between the two wall structures. At the same time we gain an understanding of the deposition process resulting in the complex, attractive structure of the mature spore.

The heart of the book is the profusely illustrated survey of genera. Worldwide in scope, the survey includes a broad representation of all the major groups of ferns, lycopsids, horsetails, and psilophytes. The text for each genus addresses the circum-

scription and size of the genus, its range, and details of spore size and morphology, as well as a longer section outlining the relationships of the group based on spore morphology and insights into variation within the group. A literature summary ends each generic treatment. The illustrations for each genus include an array of Scanning Electron Microscope images of the surface features of the spores, and Transmission Electron Micrographs of interior features are often included as well. The images are technically of the highest quality, and the standard magnification for all whole-spore images allows easy visual comparison of spore size. The utility of the volume is further increased with a glossary of the technical terms relevant to characterizing spore morphology.

This work of Tryon and Lugardon is a milestone in the understanding of spore wall structure and development. The exhaustive review of spore diversity coupled with the well developed analytic section in the introduction supports the continued development of spore architecture as a character system for systematic studies in the ferns and other spore-dispersed plants.

DAVID S. BARRINGTON
PRINGLE HERBARIUM
DEPARTMENT OF BOTANY
UNIVERSITY OF VERMONT
BURLINGTON, VT 05405-0086